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1 The automatic improvement of locality in storage systems



Windsor W. Hsu, Alan Jay Smith, Honesty C. Young

 November 2005 **ACM Transactions on Computer Systems (TOCS)**, Volume 23 Issue 4

Publisher: ACM Press

 Full text available: [pdf\(2.58 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Disk I/O is increasingly the performance bottleneck in computer systems despite rapidly increasing disk data transfer rates. In this article, we propose Automatic Locality-Improving Storage (ALIS), an introspective storage system that automatically reorganizes selected disk blocks based on the dynamic reference stream to increase effective storage performance. ALIS is based on the observations that sequential data fetch is far more efficient than random access, that improving seek distances prod ...

Keywords: Data layout optimization, block layout, data reorganization, data restructuring, defragmentation, disk technology trends, locality improvement, prefetching

2 Scalable and fault-tolerant support for variable bit-rate data in the exedra streaming server



Stergios V. Anastasiadis, Kenneth C. Sevcik, Michael Stumm

 November 2005 **ACM Transactions on Storage (TOS)**, Volume 1 Issue 4

Publisher: ACM Press

 Full text available: [pdf\(1.01 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We describe the design and implementation of the Exedra continuous media server, and experimentally evaluate alternative resource management policies using a prototype system that we built. Exedra has been designed to provide scalable and efficient support for variable bit-rate media streams whose compression efficiency leads to reduced storage space and bandwidth requirements in comparison to constant bit-rate streams of equivalent quality. We examine alternative disk striping policies, and qua ...

Keywords: Content distribution, multimedia compression

3 Memory system performance of UNIX on CC-NUMA multiprocessors



John Chapin, A. Herrod, Mendel Rosenblum, Anoop Gupta

 May 1995 **ACM SIGMETRICS Performance Evaluation Review**, Proceedings of the

1995 ACM SIGMETRICS joint international conference on Measurement and modeling of computer systems SIGMETRICS '95/PERFORMANCE '95,
Volume 23 Issue 1

Publisher: ACM Press

Full text available:  [pdf\(1.78 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This study characterizes the performance of a variant of UNIX SVR4 on a large shared-memory multiprocessor and analyzes the effects of possible OS and architectural changes. We use a nonintrusive cache miss monitor to trace the execution of an OS-intensive multiprogrammed workload on the Stanford DASH, a 32-CPU CC-NUMA multiprocessor (CC-NUMA multiprocessors have cache-coherent shared memory that is physically distributed across the machine). We find that our version of UNIX accounts for 24% of ...

4 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Publisher: IBM Press

Full text available:  [pdf\(4.21 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

5 Web-conscious storage management for web proxies

Evangelos P. Markatos, Dionisios N. Pnevmatikatos, Michail D. Flouris, Manolis G. H. Katevenis

December 2002 **IEEE/ACM Transactions on Networking (TON)**, Volume 10 Issue 6

Publisher: IEEE Press

Full text available:  [pdf\(603.11 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Many proxy servers are limited by their file I/O needs. Even when a proxy is configured with sufficient I/O hardware, the file system software often fails to provide the available bandwidth to the proxy processes. Although specialized file systems may offer a significant improvement and overcome these limitations, we believe that user-level disk management on top of industry-standard file systems can offer similar performance advantages. In this paper, we study the overheads associated with file ...


Keywords: secondary storage, web caching, web performance, web proxies

6 Computing curricula 2001

September 2001 **Journal on Educational Resources in Computing (JERIC)**

Publisher: ACM Press

Full text available:  [pdf\(613.63 KB\)](#)

 [html\(2.78 KB\)](#)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

7 4.2BSD and 4.3BSD as examples of the UNIX system

John S. Quarterman, Abraham Silberschatz, James L. Peterson


December 1985 **ACM Computing Surveys (CSUR)**, Volume 17 Issue 4


Publisher: ACM Press

Full text available:  [pdf\(4.07 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

This paper presents an in-depth examination of the 4.2 Berkeley Software Distribution, Virtual VAX-11 Version (4.2BSD), which is a version of the UNIX Time-Sharing System. There are notes throughout on 4.3BSD, the forthcoming system from the University of California at Berkeley. We trace the historical development of the UNIX system from its conception in 1969 until today, and describe the design principles that have guided this development. We then present the internal data structures and ...

8 Trace-driven memory simulation: a survey


 Richard A. Uhlig, Trevor N. Mudge
June 1997 **ACM Computing Surveys (CSUR)**, Volume 29 Issue 2
Publisher: ACM Press

Full text available:  [pdf\(636.11 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

As the gap between processor and memory speeds continues to widen, methods for evaluating memory system designs before they are implemented in hardware are becoming increasingly important. One such method, trace-driven memory simulation, has been the subject of intense interest among researchers and has, as a result, enjoyed rapid development and substantial improvements during the past decade. This article surveys and analyzes these developments by establishing criteria for evaluating trac ...

Keywords: TLBs, caches, memory management, memory simulation, trace-driven simulation

9 Experience Using Multiprocessor Systems—A Status Report

 Anita K. Jones, Peter Schwarz
June 1980 **ACM Computing Surveys (CSUR)**, Volume 12 Issue 2
Publisher: ACM Press


Full text available:  [pdf\(4.48 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

10 Multimedia support for databases

 Banu Özden, Rajeev Rastogi, Avi Silberschatz
May 1997 **Proceedings of the sixteenth ACM SIGACT-SIGMOD-SIGART symposium on Principles of database systems**
Publisher: ACM Press

Full text available:  [pdf\(1.90 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

11 Frangipani: a scalable distributed file system

 Chandramohan A. Thekkath, Timothy Mann, Edward K. Lee
October 1997 **ACM SIGOPS Operating Systems Review , Proceedings of the sixteenth ACM symposium on Operating systems principles SOSP '97**, Volume 31 Issue 5

Publisher: ACM Press

Full text available:  [pdf\(2.20 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

12 Sensornet services: TSAR: a two tier sensor storage architecture using interval skip graphs



Peter Desnoyers, Deepak Ganesan, Prashant Shenoy

November 2005 **Proceedings of the 3rd international conference on Embedded networked sensor systems SenSys '05**

Publisher: ACM Press

Full text available: pdf(444.47 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Archival storage of sensor data is necessary for applications that query, mine, and analyze such data for interesting features and trends. We argue that existing storage systems are designed primarily for flat hierarchies of homogeneous sensor nodes and do not fully exploit the multi-tier nature of emerging sensor networks, where an application can comprise tens of tethered proxies, each managing tens to hundreds of untethered sensors. We present *TSAR*, a fundamentally different storage architecture ...

Keywords: archival storage, indexing methods, wireless sensor networks

13 NiagaraCQ: a scalable continuous query system for Internet databases



Jianjun Chen, David J. DeWitt, Feng Tian, Yuan Wang

May 2000 **ACM SIGMOD Record , Proceedings of the 2000 ACM SIGMOD international conference on Management of data SIGMOD '00**, Volume 29 Issue 2

Publisher: ACM Press

Full text available: pdf(165.02 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Continuous queries are persistent queries that allow users to receive new results when they become available. While continuous query systems can transform a passive web into an active environment, they need to be able to support millions of queries due to the scale of the Internet. No existing systems have achieved this level of scalability. NiagaraCQ addresses this problem by grouping continuous queries based on the observation that many web queries share similar structures. Grouped queries ...

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